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Influence of Increased Trainees' Enrolment on Collaboration Between Industries and TVET Institutions in Public TVET Institutions in Uasin Gishu County, Kenya

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Abstract

Technical and Vocational Education and Training (TVET) institutions play a central role in producing a skilled workforce for Kenya's growing economy. Recent government initiatives to expand access have led to increased enrolments in public TVET institutions, raising concerns about how this growth affects collaboration with industries that are vital for practical skill development. This study examined the influence of increased trainees' enrolment on collaboration between industries and public TVET institutions in Uasin Gishu County, Kenya. A descriptive research design guided the study, targeting 17,800 trainees, 750 trainers, and 4 principals across four institutions. Using stratified and simple random sampling, the study engaged 1,780 trainees, 75 trainers, and all four principals. Data were collected through questionnaires and interviews, then analyzed using both descriptive statistics and thematic analysis. Findings revealed that industrial attachment remains the most common form of collaboration, followed by workshops, seminars, and limited research partnerships. However, the effectiveness of these collaborations was rated low, with 65.9% of trainees and 67.2% of trainers indicating that current industry linkages were not effective. The main challenges included resource constraints, technological gaps, limited time for industry engagement, and inconsistent support for securing attachments. Principals further highlighted systemic barriers such as understaffing, inadequate funding, and logistical difficulties that undermine institutional capacity to sustain quality training amid rising enrolment. The study concludes that while industry attachments dominate collaboration efforts, they are insufficient to address the growing skill demands under increased enrolment.

Strengthening partnerships through dual training models, co-designed curricula, shared training facilities, and structured mentorship is necessary to enhance training quality. The study recommends greater government support in aligning enrolments with institutional capacity, expanded industry participation in training, and investment in modern facilities to ensure TVET graduates are adequately prepared for the labour market.

Keywords: TVET institutions, industry collaboration, trainees' enrolment, industrial attachment, Uasin Gishu County, Kenya

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Introduction

Technical and Vocational Education and Training (TVET) is globally recognized as a critical mechanism for equipping learners with the practical, job-specific competencies required by modern employers. Consequently, the strength, formality, and effectiveness of linkages between TVET providers and industry partners directly determine the relevance of training and, ultimately, the employability of graduates (Alemán-Falcón, 2022). Leading developed systems universally demonstrate the value of formal, sustained employer engagement. This engagement, characterized by shared training responsibility, workplace instruction, and systematic assessment, is essential for maximizing workplace readiness and ensuring a smooth school-to-work transition (Euler, 2017; Hussain, 2021). Parallel studies from countries like the UK and Australia further emphasize that clear employer incentives, joint curriculum design, and structured apprenticeship frameworks are key factors in strengthening these vital industry–training partnerships and improving training relevance (Relly, 2022; Waugh, 2024).

Despite the clear imperative for robust industry-TVET collaboration, its implementation faces significant structural barriers, particularly across Africa. Research highlights pervasive constraints, including weak coordination mechanisms between institutions and firms, limited industry capacity to effectively host and mentor trainees, and critical resource gaps within the TVET institutions themselves (Haßler et al.,

2021). The prevalent drive for rapid expansion in TVET enrollment across the continent has often outpaced institutional capacity and industry engagement, leading to recurring constraints documented in multiple empirical studies. A broad systematic review of qualitative TVET studies in low- and middle-income countries found that increased enrollment often coincides with debilitating shortages of qualified instructors, limited access to functional workshops, and weak employer linkages. These combined factors critically reduce the practical value of TVET programs and compromise graduates' workplace readiness (Shi et al., 2022).

An International Labour Organization (ILO) synthesis across seven African countries (including Ethiopia, Ghana, and South Africa) reports that while many governments have successfully expanded TVET access, collaboration mechanisms with industry remain inconsistent. Specifically, industry capacity to host the growing number of trainees and provide meaningful workplace learning is often limited, and institutional resources such as equipment and qualified trainers consistently lag behind the pace of enrollment growth (ILO, 2024). The ILO study explicitly links these deficits to lower employer trust and a reduced willingness to take on apprentices and interns. Furthermore, in South Africa, empirical work finds that stronger college–industry partnerships improve curriculum relevance and student employability, but that existing partnerships are uneven and heavily constrained by outdated equipment, limited company incentives, and weak governance of partnership structures (Njengele, 2024). Research examining the implications of the Fourth Industrial Revolution in South African TVET highlights another dimension: technology-driven skill demands raise the bar for equipment and teacher competency, and institutions struggle to update facilities and forge the intensive industry ties needed to deliver new digital skills at scale (Magagula, 2024). This pressure is echoed in other contexts; evidence from Cameroon and other francophone settings shows that public–private partnership (PPP) models, while potentially strengthening TVET–industry links, only succeed when there are clear roles, shared financing, and adequate capacity among local firms to deliver placements. Absent these conditions, PPPs perform poorly and fail to resolve the crucial skill-practice gaps (Ndlovu & Van Wyk, 2023). Complementary research in Ethiopia notes that implementation gaps including weak coordination, variable employer commitment, and inadequate trainer upskilling limit the conversion of enrollment gains into quality training outcomes, despite policy frameworks increasingly emphasizing industry engagement (ACET, 2022).

In Kenya, TVET is strategically positioned as a central pillar for equipping youth with the skills needed for employment and supporting national economic growth (Khatete & Chepkoech, 2018). Kenya's recent policy push to aggressively expand access has, over the past few years, resulted in a sharp increase in trainee numbers across public TVETs. This rapid enrollment growth creates a critical risk: that the rate of expansion will outpace industry absorptive capacity and institutional readiness, thereby producing large cohorts of graduates who possess limited hands-on experience despite longer periods of classroom exposure.

Empirical studies in Kenya consistently illustrate the local manifestations of these challenges. Okemwa, Ferej, and Wanami (2022) found that public TVET institutions in Nairobi have minimal operational collaboration with industry in specialized areas like electronics laboratory training, even when attempting to include industry-relevant

skills independently. Conversely, evidence also suggests solutions: Musyimi (2021) demonstrated that the provision of modern equipment improved the alignment of training environments with industry expectations, which subsequently boosted institutional collaboration and led to better employability outcomes for students. Mutembei, Kibaara, and Gichohi (2024) highlighted that while industrial engagement in Meru County significantly affects graduate employability skills, gaps remain in arranging consistent attachments and structured workplace connections. Furthermore, research in Kakamega County by Muthoka, Wangila, and Ongeti (2025) found that the quality of the induction process during industrial attachment plays a major role in trainees' ability to acquire vocational skills, suggesting that weak or absent induction undermines practical training outcomes.

In Uasin Gishu County, located in Kenya's Rift Valley region, both industrial activity and TVET institutions are concentrated, creating high demand for skilled labor but also intensifying pressure on collaboration mechanisms. The county hosts several flagship institutions, including Eldoret National Polytechnic, Rift Valley Technical Training Institute, and Kipkabus Technical and Vocational College. Recent education statistics show that enrolment in public TVET institutions more than doubled within five years, rising from about 7,500 trainees in 2018 to over 17,800 in 2023 (Uasin Gishu County Directorate of Education, 2023).

This expansion has generated opportunities for skill development but also serious challenges. Overcrowded workshops and classrooms, escalating trainer–trainee ratios, and heightened competition for industrial attachment placements strain the ability of both institutions and industries to provide meaningful learning experiences. For instance, the trainer–trainee ratio in the county's public TVET institutions averages 1:40, far higher than the recommended 1:20 for practical-based courses. Such disparities raise concerns about the quality of hands-on training and the readiness of graduates to meet industry standards. study examined how increased trainee enrolment influences collaboration between industries and TVET institutions in delivering quality training.

Methodology

This study was conducted in TVET institutions in Uasin Gishu County, Kenya (Figure 1). The County is among the 47 counties in the Republic of Kenya and is situated in the previous Rift Valley Province. Eldoret town is the largest town in Uasin Gishu, hosting the County's commercial and administrative offices. The county is positioned on a plateau and enjoys a temperate and mild climate. It is about 330km to the North-West of Nairobi City, located in the Mid-West of Kenya's Rift Valley. The County is cosmopolitan; however, the Nandi communities have the highest settlemefnt. The County covers an area of 3,345.2 square kilometers. The main economic activities in the county include; horticulture, wheat farming, sports tourism, maize farming, and dairy farming. The County has six constituencies which include: Moiben, Turbo, Kesses, Soy, Kapseret, and Ainabkoi.

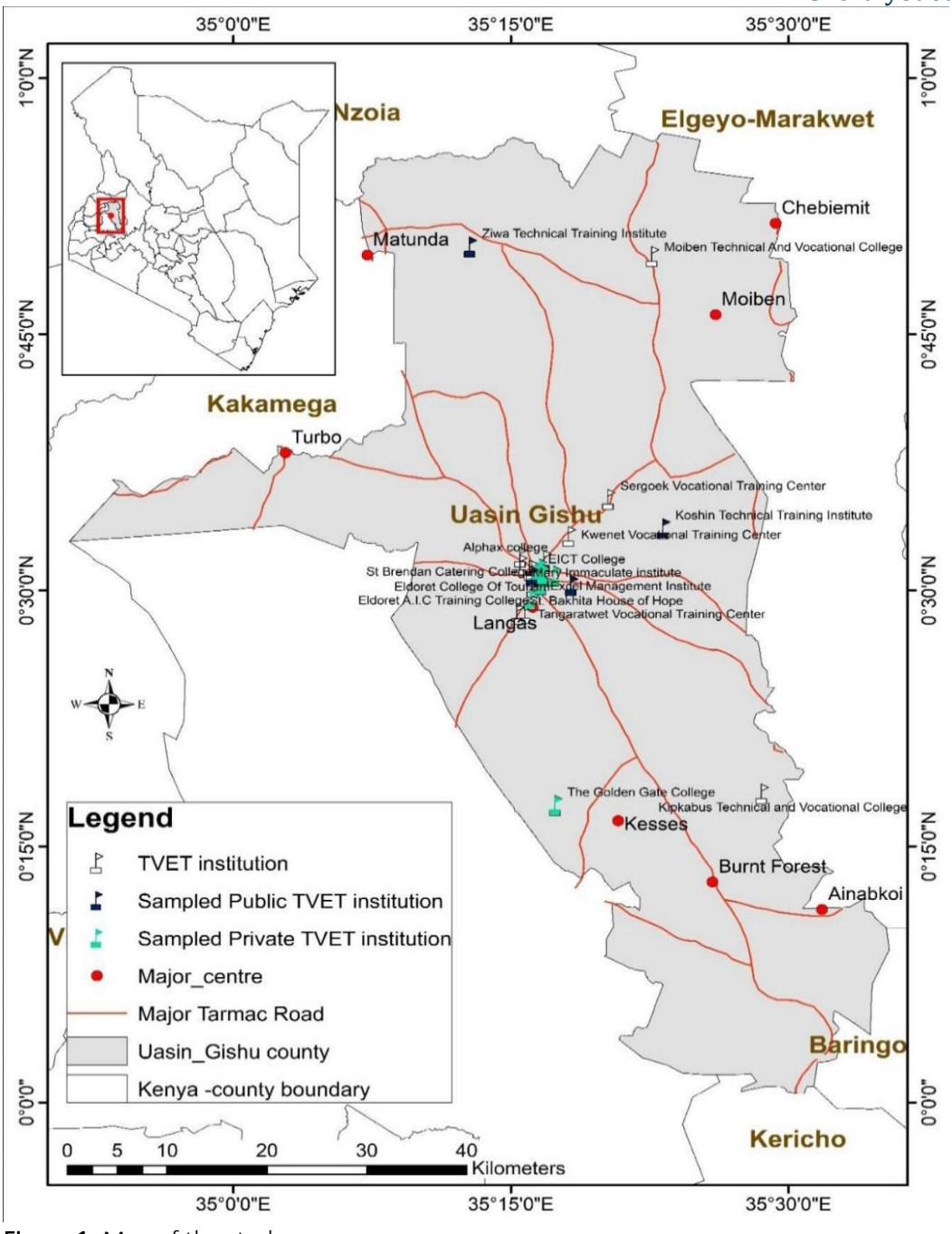

Figure 1: Map of the study area
Source: Author (2023)

This study adopted a descriptive survey design, which allowed both quantitative and qualitative data to be collected without manipulating variables. The design made it possible to capture data from a large sample while also incorporating in-depth views, producing results that represented the wider population.

The target population consisted of about 17,800 trainees, 750 trainers, and 4 principals from Eldoret National Polytechnic, Rift Valley Technical Training Institute, Kipkabus Technical Training Institute, and Koshin Technical Training

Institute. Mugenda and Mugenda (2003) suggest that for large populations, a sample of 10% to 30% is adequate, while small populations can be studied in full. Based on this guideline, 10% of the trainees and trainers were sampled, giving 1,780 trainees and 75 trainers as indicated in Table 1. All four principals were included through census sampling due to their small number. Purposive sampling was used to select the four institutions because of their high enrolment, while stratified sampling grouped respondents into principals, trainers, and trainees. Census sampling was applied to principals, and simple random sampling was used to select trainers and trainees.

Table 1: Target population and sample size

Institution	Population (Approximate)			Sample/Selected		
	Trainees	Trainers	Principals	Trainees	Trainers	Principals
1.Eldoret National polytechnic	8000	400	1	800	40	1
2.Rift Valley Technical Training Institute	6300	214	1	630	22	1
3.Kipkabus Technical Training Institute	2000	70	1	200	7	1
4.Koshin Technical Training Institute	1500	60	1	150	6	1
Total	**17800**	**750**	**4**	**1780**	**75**	**4**

Source: Author (2023)

Data was collected using questionnaires administered to trainers and trainees, and interview guides conducted with principals. Interviews provided qualitative insights into institutional perspectives on industry linkages and challenges linked to rising enrolment.

The research instruments were piloted at Kitale National Polytechnic with 30 trainees, 10 trainers, and the principal. Feedback from the pilot informed revisions to eliminate ambiguity, while expert review from supervisors further strengthened content validity. Reliability was assessed using Cronbach's alpha, which evaluates the internal consistency of items. The analysis produced coefficients of 0.84 for trainees, 0.89 for trainers, and 0.96 for the principal. Since all values exceeded the 0.70 benchmark (Mugenda & Mugenda, 2003; Taber, 2018), the instruments were considered highly reliable for measuring the effects of increased enrolment on industry collaboration and training quality in the selected TVET institutions.

Quantitative data was coded and analyzed using SPSS Version 29 to generate descriptive statistics, including frequencies and percentages. Results were presented in tables and graphs. Qualitative data from interviews was analyzed thematically, with key statements from principals coded and interpreted in relation to the study objectives.

Results and Discussion

Demographic Profile of Participants

The study collected demographic data from both trainees and trainers in public TVET institutions in Uasin Gishu County. Table 2 presents a consolidated demographic profile of the participants, combining data from both trainees and trainers.

Table 2: Demographic profile of participants (trainees and trainers)

Category	Variable	Group	Frequency	Percentage
Trainees (n = 1452)	Gender	Male	816	56.2
		Female	636	43.8
	Age (Years)	15–19	253	17.44
		20–24	1123	77.34
		25–30	56	3.85
		Above 30	20	1.37
	Year of Study	First Year	523	36.02
		Second Year	492	33.88
		Third Year	437	30.10
	Level of Training	Diploma	773	53.24
		Craft	467	32.16
		Artisan	212	14.60
Trainers (n = 58)	Gender	Male	36	62.07
		Female	22	37.93
	Age (Years)	20–29	29	50.00
		30–39	16	27.60
		40–49	11	19.00
		50 and above	2	3.40
	Teaching Experience (Years)	0–4	12	20.70
		5–9	27	46.60
		10–14	13	22.40
		15 and above	6	10.30
	Industrial Assessment Experience	Yes	33	56.90
		No	25	43.10

Source: Author (2024)

The demographic data show that male trainees (56.2%) outnumbered females (43.8%), highlighting gender imbalance in technical education. This reflects national patterns where men dominate technical and engineering programs, despite policies promoting female enrolment (Ngugi & Muthima, 2017). Gender disparities may influence collaboration with industries, especially where workplace opportunities remain male-oriented. Studies in Kenya have emphasized the need for gender-sensitive TVET reforms to promote inclusivity and industry relevance (Kiprono et al., 2022).

Age distribution reveals that 94.8% of trainees were below 25 years, with 77.3% concentrated in the 20–24 age

bracket. This indicates that TVET institutions primarily attract recent secondary school graduates. Similar findings by Njenga (2023) show that younger trainees often require greater mentorship and institutional support compared to mature learners. The predominance of young learners increases demand for industry partnerships, since they need practical exposure to transition into the workforce effectively.

Distribution by year of study was fairly even, with first-year students at 36.0%, second-years at 33.9%, and third-years at 30.1%. This balance provides insights from learners at different training stages. According to Mbonambi (2024), first-year students often struggle with adjustment, while senior students face challenges accessing industrial attachments due to competition for limited slots. This makes collaboration with industries necessary for accommodating increased enrolment across all training stages.

At the training level, more than half of the trainees (53.2%) were enrolled in diploma programs, followed by craft (32.2%) and artisan (14.6%). This aligns with Kenya's education policy shift that prioritizes diploma training to meet labor market demands (Barasa, 2021). However, Kigwilu, Akala and Wambua (2016) cautions that crafts and artisan programs, which require more practical learning, often lack adequate workshop resources, creating gaps in skill readiness. Rising enrolment in these categories underscores the need for expanded industry partnerships to provide hands-on training.

Trainer demographics reveal that 62.1% were male and 37.9% female, confirming gender imbalance not only among trainees but also within teaching staff. The majority of trainers (77.6%) were below 40 years, with half aged 20–29. While younger trainers bring adaptability and technological awareness, studies show they may lack the depth of industry exposure and classroom management experience required under large enrolments (Lux, 2023). Nearly half of the trainers (46.6%) had 5–9 years of teaching experience, suggesting a moderately skilled workforce, though continuous professional development is necessary to strengthen capacity.

On industrial assessment, 56.9% of trainers had assessed students on attachment while 43.1% had not. This gap raises concerns since industry-based training is central to competency-based TVET. Muchira et al. (2023) noted that limited trainer involvement in industrial assessment weakens the connection between classroom knowledge and workplace skills. With rising enrolment, insufficiently prepared trainers may struggle to supervise and assess all students in industry placements, potentially straining institutional–industry collaboration.

Forms of Collaborations between TVET Institutions and Industries

The Table 3 below shows frequencies of the distribution of the results obtained from trainees and trainers on the forms of collaboration between TVET institutions and industries.

The findings show responses from trainers and trainees on the forms of collaboration between TVET institutions and industries. The most widely recognized form of collaboration was industrial attachment, with 32.9% of trainees and 55.2% of trainers identifying it as the main link. This confirms that attachment remains the most established pathway for bridging training institutions and workplaces, as it provides students with hands-on exposure to industrial settings. Kenyan studies consistently emphasize its importance. For instance, Mutembei, Kibaara, and Gichohi (2024) found that industrial attachment significantly influenced employability skills

among TVET graduates in Meru County, while Muthoka, Wangila, and Ongeti (2025) noted that the quality of induction during attachment determines the extent of skills transfer.

Table 3: Trainers' and trainees' input on the forms of collaborations between TVET institutions and industries

S/NO	Form of Collaboration	Frequency			
		Trainees		Trainers	
1	Research and Innovation	270	18.6%	12	20.7%
2	Placement of Trainees for Attachment	478	32.9%	32	55.2%
3	Career Talks and Advisement	184	12.6%	9	15.5%
4	Workshops and Seminars	291	20.0%	16	27.6%
5	Educational Trips	229	15.7%	19	32.7%

Source: Author (2024)

The second most cited form of collaboration was workshops and seminars, acknowledged by 20.0% of trainees and 27.6% of trainers. These engagements allow institutions and industries to exchange knowledge on emerging technologies and sector practices. Similar findings were reported in Kakamega County, where industry-facilitated seminars exposed trainees to current market practices, but irregular scheduling limited their effectiveness (Muthoka et al., 2025).

Research and innovation ranked third, with 18.6% of trainees and 20.7% of trainers indicating participation. This relatively low uptake aligns with Okemwa, Ferej, and Wanami's (2022) observation that most Kenyan TVET institutions struggle to embed collaborative research with industries due to weak institutional frameworks and resource gaps. Strengthening research partnerships would not only advance innovation but also improve curriculum alignment with industrial needs.

Educational trips (16.4%) and career talks/advisement (12.8%) were less emphasized, though both remain useful for broadening learners' career awareness and motivation. Musyimi (2021) similarly reported that such activities were often ad hoc in Nairobi-based TVET institutions, limiting their impact compared to more structured collaborations like attachments.

Effectiveness of Collaborations between TVET Institutions and Industries

The study sought to assess the perceived effectiveness of collaborations between TVET institutions and industries. Table 4 presents responses from both trainees and trainers. The majority of both trainees (65.9%) and trainers (67.2%) reported that collaborations between TVET institutions and industries were not effective. Only 22.8% of trainees and 24.1% of trainers perceived the partnerships as effective, while 11.3% of trainees and 8.6% of trainers were uncertain. These findings suggest that despite the existence of linkages, many stakeholders believe that the collaborations do not adequately support training quality or enhance employability.

Table 4: Trainers' and trainees' input on the effectiveness of collaborations between TVET institutions and industries

Question		Frequency			
		Trainees		Trainers	
Are the collaborations effective?	Yes	331	22.8%	14	24.1%
	No	957	65.9%	39	67.2%
	Don't Know	164	11.3%	5	8.6%

Source: Author (2024)

Trainers' and Trainees' Explanation of Ineffective Collaborations between TVET Institutions and Industries

To better understand why collaborations were perceived as ineffective, only trainees and trainers who responded "No" in Table 4 were asked to provide explanations. Their views are summarized in Table 5.

Table 5: Reasons for ineffectiveness of collaborations between TVET Institutions and industries

Why are the collaborations not effective?	frequency			
	trainees		trainers	
Some industries deny requests for industrial attachment opportunities due to overwhelming numbers of students seeking attachment in the industries.	413	43.2%	21	53.8%
TVET institutions have shunned embracing the industries to enable effective partnership as they lack the capacity to strike a balance between provision of in-school training and field-based/ industry-based training	544	56.8%	18	46.2%

Source: Author (2024)

The findings show that 56.8% of trainees and 46.2% of trainers attributed the ineffectiveness to TVET institutions' limited capacity to integrate in-school and industry-based training. On the other hand, 43.2% of trainees and 53.8% of trainers cited industries' denial of attachment requests due to the high volume of students. This indicates that challenges exist both on the side of industries and the institutions, limiting the effectiveness of collaborations.

These results align with previous studies in Kenya. Ayieko, Okemwa and Muthoka (2023) found that TVET institutions often struggle to provide adequate industry exposure because of weak institutional frameworks and limited collaboration capacity.

Key Challenges Institutions Face while Engaging in Collaborations with Industries

In the third question, trainers and trainees provided their input on the key challenges that TVET institutions encountered while collaborating with the industries to maintain quality training. Table 6 below provides the summary of the results obtained on the Key Challenges Institutions Face while Engaging in Collaborations with Industries.

Table 6: Trainers' and trainees' views on the key challenges institutions face while engaging in collaborations with industries.

Key Challenges	Frequency			
	Trainees		Trainers	
Technological variations	270	18.6%	12	20.7%
Resource constraints	478	32.9%	32	55.2%
Limited time	184	12.6%	9	15.5%

Source: Author (2024)

The most frequently cited challenge by both trainers (55.2%) and trainees (32.9%) is resource constraints. This suggests that institutions are struggling to provide adequate training materials, equipment, and human resources, a problem that is significantly worsened by increased student enrolment. As more students are admitted without a corresponding increase in resources, institutions become overstretched, resulting in reduced opportunities for effective industry collaboration and practical training, ultimately lowering the quality of training.

Technological variations were also noted as a key challenge by 20.7% of trainers and 18.6% of trainees. With the growing number of students, institutions may find it difficult to upgrade or expand their technological infrastructure to meet modern industry standards. This technological mismatch limits the relevance and effectiveness of training, as students are not exposed to the tools and systems used in the workplace. Additionally, limited time was cited by 15.5% of trainers and 12.6% of trainees. Increased enrolment places greater demands on trainers' time, leaving them with fewer opportunities to develop and maintain industry linkages or to engage students in in-depth, hands-on industrial experiences. Overall, the findings indicate that increased enrolment adversely affects the quality of training in TVET institutions by exacerbating existing challenges in industry collaboration, particularly through strained resources, outdated technology, and time constraints.

The challenges identified in this study align with empirical evidence from across Kenya. Okemwa, Ferej, and Wanami (2022) established that even in specialized areas such as electronics laboratory training, public TVET institutions in Nairobi exhibited minimal collaboration with industries, underscoring how resource and technological gaps hinder meaningful partnerships. At the same time, some studies suggest potential solutions. Musyimi (2021) found that the introduction of modern equipment enhanced the relevance of training environments, improved collaboration with industries, and resulted in stronger employability outcomes for graduates. Similarly, Mutembei, Kibaara, and Gichohi (2024) noted that industrial engagement in Meru County positively influenced graduate employability but highlighted persistent challenges in securing consistent attachments and structured workplace linkages. Adding to this, Muthoka, Wangila, and Ongeti (2025) demonstrated that the quality of induction during industrial attachments in Kakamega County was central to trainees' ability to acquire practical skills, with weak or absent induction significantly undermining training effectiveness.

Strategies Being Employed by the Institutions to Ensure Sustainability of Collaborative Efforts

The trainers and trainees identified various strategies that were

being employed by the institutions to ensure sustainability of collaborative efforts during increased enrollment to ensure quality training of trainees. Table 7 below provides the summary of the results obtained on Strategies Being Employed by the Institutions to Ensure Sustainability of Collaborative Efforts.

Table 7: Trainers' and trainees' views on strategies being employed by the institutions to ensure sustainability of collaborative efforts

S/NO	Strategies being Employed	Frequency			
		Trainees		Trainers	
1	Establishment of a comprehensive framework for collaboration	270	18.6%	12	20.7%
2	Establishing clear goals and expectations for collaborations	478	32.9%	32	55.2%
3	Widening links with industries	184	12.6%	9	15.5%
4	Allocating more resources to support collaborations.	291	20.0%	16	27.6%

Source: Author (2024)

The most frequently mentioned strategy among trainees (32.9%) and trainers (55.2%) was establishing clear goals and expectations for collaborations. This suggests that both groups acknowledge the necessity of defining specific objectives to ensure effective partnerships between institutions and industries. The second most commonly cited strategy by trainees (20.0%) and trainers (27.6%) was allocating more resources to support collaborations. This indicates that financial and material support plays a crucial role in sustaining partnerships. Adequate funding ensures that trainers can participate in industry assessments, institutions can facilitate industrial linkages, and trainees can access better training opportunities. The difference in response rates between trainees and trainers may be attributed to trainers having a more direct understanding of budget constraints and resource allocation challenges.

The establishment of a comprehensive framework for collaboration was recognized by 18.6% of trainees and 20.7% of trainers. This reflects the need for structured policies and guidelines that define roles, responsibilities, and expectations within collaborative arrangements.

Also, widening links with industries was identified by 12.6% of trainees and 15.5% of trainers. While this strategy received the least emphasis, it remains an essential factor in fostering industry-academic partnerships. Expanding industry connections can provide trainees with more diverse training opportunities, increase employment prospects, and enhance the relevance of TVET programs. The relatively lower prioritization of this strategy could be due to existing industry linkages that institutions have already established, though continuous efforts in this area remain necessary.

Role of Government Policy in Facilitating or Hindering Collaboration between TVET Institutions and Industries.

Table 8 below provides the summary of the results obtained on the role of government policy in facilitating or hindering collaboration between TVET Institutions and Industries.

Table 8: Trainers' and trainees' views on the role of government policy in facilitating or hindering collaboration between TVET institutions and industries

S/NO	Role of Government Policy	Frequency			
		Trainees		Trainers	
1	Issuing machines to industries	213	14.7%	11	19.0%
2	Controlling the number of trainees	572	39.4%	45	77.6%
3	Providing incentives and establishing guidelines for collaboration	173	12.0%	5	8.6%
4	Funding of institution and industries.	282	19.4%	14	24.1%
5	Building infrastructure	143	9.8%	7	12.1%
6	Deploying trainers to up skill the trainees	132	9.1%	11	19.0%

Source: Author (2024)

According to the findings, the most prominent issue identified by both trainers (77.6%) and trainees (39.4%) is the lack of control over the number of trainees. This significantly affects training quality because when enrolment exceeds the capacity of institutions, the available resources such as equipment, trainers, and physical space are overstretched. This overcrowding limit individualized attention, practical exposure, and effective engagement with industry, leading to superficial or compromised skill development.

Another major concern is insufficient funding for both institutions and industries, this is noted that 24.1% of trainers and 19.4% of trainees. Without adequate financial support, institutions cannot purchase modern equipment, retain and hire qualified staff, or support trainees in accessing industry-based learning. Similarly, industries may lack motivation to collaborate if government support is inadequate. Poor funding therefore results in outdated training, limited practical exposure, and weak industry linkages, all of which diminish the relevance and quality of the training offered.

Issuing machines to industries and deploying trainers to up skill trainees were each acknowledged by 19.0% of trainers, highlighting the importance of equipping both industries and institutions with the tools and expertise necessary for effective training. When industries are well-equipped and institutions can send qualified trainers to up skill learners, the training becomes more aligned with current industry standards, thereby improving its quality. However, when such policies are not implemented or supported, trainees miss out on real-world, hands-on experience, reducing their readiness for the job market.

Furthermore, inadequate infrastructure (identified by 12.1% of trainers and 9.8% of trainees) and a lack of incentives or clear guidelines for collaboration (8.6% and 12.0%, respectively) also hinder effective partnerships. Poor infrastructure means limited workshop space, outdated facilities, and overcrowded classrooms all of which restrict practical training opportunities. A lack of structured policies and incentives can lead to weak or inconsistent partnerships with industries, further reducing the quality and applicability of training.

Presence of Joint Efforts between Institutions and Industries to Help Accommodate Increased Enrolment.

Table 9 below provides the summary of the results obtained on the presence of joint efforts between institutions and industries to help accommodate increased enrolment.

Table 9: Trainers' and Trainees' Input on Presence of Joint Efforts between Institutions and Industries to Help Accommodate Increased Enrolment

Question		Frequency			
		Trainees		Trainers	
Are there any joint efforts that exist between institutions and industries to help accommodate increased enrolment?	Yes	969	66.7%	35	60.3%
	No	365	25.1%	20	34.5%
	Don't Know	118	8.2%	3	5.2%

Source: Author (2024)

Only those trainers' and trainees' who admitted that there were joint efforts between institutions and industries to help accommodate increased enrolment gave some examples of the existing joint efforts between institutions and industries.

Table 10: Existing joint efforts between institutions and industries

Some of the existing joint efforts between institutions and industries	Frequency			
	Trainees		Trainers	
Making internship agreements and attachment agreements with industries.	723	74.6%	32	91.4%
donating relevant equipment to workshops based in TVET institutions to eliminate skills mismatch	723	74.6%	32	91.4%
Linking trainees to companies for attachment	969	100%	35	100%

Source: Author (2024)

The findings suggest that a majority of both trainees (66.7%) and trainers (60.3%) acknowledge the existence of joint efforts between TVET institutions and industries to help accommodate increased enrolment. This indicates a positive collaboration aimed at enhancing skill acquisition and industrial exposure for trainees. However, a notable percentage of trainees (25.1%) and trainers (34.5%) believe that no such efforts exist, highlighting potential inconsistencies in the implementation or awareness of these collaborations. Additionally, a small proportion of respondents (8.2% of trainees and 5.2% of trainers) were uncertain about the existence of joint efforts, suggesting a possible gap in communication regarding institutional-industry partnerships.

For those who acknowledged the presence of joint efforts, the key strategies identified include internship and attachment agreements with industries, donation of relevant equipment to TVET workshops to bridge skill gaps, and linking trainees to companies for attachment opportunities. These efforts reflect a shared commitment to improving practical training, ensuring that trainees gain industry-relevant skills. However, the significant proportion of respondents who do not recognize such collaborations implies that these efforts may not be uniformly applied across institutions or that more awareness and engagement are needed.

Strategies that were being used to measure and evaluate the outcomes of collaborative efforts with industries to ensure the quality of training of trainees was maintained.

Table 11 below provides the summary of the results obtained on strategies that were being used to measure and evaluate the outcomes of collaborative efforts with industries to ensure the quality of training of trainees was maintained.

Table 11: Trainers' and Trainees' Views on strategies that were being used to measure and evaluate the outcomes of collaborative efforts with industries to ensure the quality of training of trainees was maintained.

S/NO	Measuring and Evaluating Strategies being Employed	Frequency			
		Trainees		Trainers	
1	Assessment of trainees	270	18.6%	12	20.7%
		1182(Did not answer/irrelevant)	81.4%	46(Did not answer/irrelevant)	79.3%
2	Marking of Logbooks	478	32.9%	32	55.2%
		974 Did not answer/irrelevant	67.1%	26 (Did not answer/irrelevant)	%44.8

Source: Author (2024)

The findings reveal that marking of logbooks is the most widely used strategy for measuring and evaluating the outcomes of collaborative efforts between TVET institutions and industries, with 32.9% of trainees and 55.2% of trainers identifying it as a key approach. This suggests that logbooks play a crucial role in tracking trainees' progress, documenting their experiences, and providing structured feedback from both industry supervisors and trainers. The higher percentage of trainers endorsing this method indicates their reliance on logbooks as a formal assessment tool to monitor skill acquisition and industry exposure.

On the other hand, assessment of trainees was recognized by 18.6% of trainees and 20.7% of trainers, indicating that direct evaluation methods such as practical exams, competency-based assessments, or industry feedback are also used but to a lesser extent. This lower percentage may suggest challenges in implementing standardized trainee assessments across institutions, possibly due to limited resources or varying industry expectations.

Collaborations between TVET Institutions and Industries

Table 12 below provides the summary of the results obtained on trainees' views on statements on collaborations between TVET Institutions and Industries. Many believe that institutional partnerships with industries have improved the quality of training, with 68% agreeing that such collaborations have enhanced learning. However, a significant number of respondents (57.8%) feel that the quality of training has been negatively impacted due to the institution's inability to secure attachment placements for all trainees, highlighting a serious gap between

enrolment growth and industrial capacity. Additionally, the response to hiring industry experts to support training efforts is mixed, with a high percentage remaining neutral, suggesting that such initiatives may not be consistently implemented across all trades or departments.

Table 12: Trainees Views on Statements on collaborations between TVET institutions and industries

Statement	Frequency (in %)				
	SD	D	N	A	SA
Our institution is partnering with many industries. This has enhanced the quality of training of trainees during these conditions of increased enrolment of trainees.	6.9	8.5	16.6	35.3	32.7
With increased enrolment, the quality of training has been negatively affected because our institution is unable to place all trainees in industries for attachment.	10.4	27.2	4.6	44.2	13.6
Increased enrolment has necessitated our institution to hire experts from various industries who visit to offer expertise in various trades to enhance quality of training.	8.8	20.7	38.9	28.7	2.9
Despite increased enrolment, our institution ensures that all trainees on attachment are assessed at least two times within their attachment period and this has maintained quality of training	19.4	9.2	6.2	28.6	36.6
Even with increased enrolment, our institution provides quality training of trainees by collaborating with more industries.	3.0	13.4	18.9	41.2	23.5
Due to increased enrolment, our institution has lost its grip with industries. Therefore, trainees find attachment industries for themselves	0	6.4	14.6	33.3	45.7

Source: Author (2024)

There is some positive feedback regarding assessment during industrial attachment, where 65.2% of trainees agree that their institution ensures they are evaluated at least twice during the attachment period. This reflects a commitment to maintaining training standards. Furthermore, 64.7% of trainees acknowledge that collaboration with more industries has been key in maintaining quality training despite increased enrolment. However, a major concern arises from the fact that 79% of trainees agree that, due to overcrowding and strained resources, institutions have lost strong ties with industries, forcing students to find attachment placements on their own. This not only points to institutional challenges in managing large trainee populations but also reveals potential inequalities in the quality of attachment experiences.

Table 13 below provides the summary of the results obtained on trainers' views on statements on

collaborations between TVET Institutions and Industries.

Table 13: Trainers' views on statements on collaborations between TVET Institutions and industries

Statement	Frequency (in %)				
	SD	D	N	A	SA
Our institution is partnering with many industries. This has enhanced the quality of training of trainees during these conditions of increased enrolment of trainees.	5.2	0	8.6	73.8	12.4
With increased enrolment, the quality of training has been negatively affected because our institution is unable to place all trainees in industries for attachment.	39.5	50.2	5.2	1.7	3.4
Increased enrolment has necessitated our institution to hire experts from various industries who visit to offer expertise in various trades to enhance quality of training.	0	0	29.4	45.1	25.5
Despite increased enrolment, our institution ensures that all trainees on attachment are assessed at least two times within their attachment period and this has maintained quality of training	0	0	9.9	22.4	67.7
Even with increased enrolment, our institution provides quality training of trainees by collaborating with more industries.	0	0	25.4	32.3	42.3
Due to increased enrolment, our institution has lost its grip with industries. Therefore, trainees find attachment industries for themselves	0	0	0	5.2	94.8

Source: Author (2024)

A large majority of trainers (86.2%) agree that their institutions are actively partnering with industries, which has enhanced the quality of training despite the higher number of trainees. This indicates a generally positive view of institutional efforts to maintain standards through industry collaboration. Interestingly, most trainers (89.7%) disagree that increased enrolment has negatively affected training quality due to a lack of industrial placements.

Moreover, 70.6% of trainers agree that increased enrolment has led their institutions to bring in industry experts to support training efforts, reinforcing the view that institutions are adapting to the pressure by seeking external expertise. When it comes to monitoring the training process, an overwhelming 90.1% of trainers affirm that trainees on attachment are assessed at least twice during their industrial period, which they believe has helped maintain training quality. This suggests that institutions have maintained structured oversight of attachments even with rising trainee numbers.

Further, a strong majority of trainers (74.6%) believe that institutions

continue to provide quality training by expanding collaborations with more industries. However, the most striking result is that 94.8% of trainers agree that, due to increased enrolment, institutions have lost their firm grip on coordinating attachments, forcing trainees to seek placements independently. This finding highlights a major concern: while trainers recognize and appreciate the efforts made to maintain training standards, they also acknowledge the overwhelming burden caused by rising enrolment, especially in managing industrial attachments.

All the principals interviewed emphasized that collaboration across departments during industrial assessments promotes teamwork and standardization, but they also noted its limitations. As Principal A put it, *"Assessments are done across departments, which encourages teamwork, but it does not fully meet the individualized training needs of each student."*

Three principals highlighted that increased enrolment has led institutions to broaden their industry partnerships. Principal B stated, *"We have expanded our partnerships with industries, and this has opened up more hands-on opportunities for our students."* Principal D added, *"Through these collaborations, trainees are better aligned with industry demands."* In addition, several principals explained that dual training systems had been introduced to respond to growing numbers. Principal A observed, *"The dual training approach, where part of the training happens in industry, has reduced pressure on our resources while improving students' practical skills."*

However, Principal C admitted that some institutions are lagging behind, saying, *"We are yet to initiate meaningful industry collaborations, which delays students' exposure to real workplace experiences."*

On student placements, principals gave mixed views. According to Principal A, *"Our students look for attachment opportunities on their own, which means some get good exposure while others miss out."* Principal C noted, *"We only manage to assist a few trainees, and this partial support leads to unequal access to industry experience."*

The principals also discussed mentorship from industry experts. Principal B shared, *"We occasionally bring in professionals to mentor students, and this gives them real-world insights."* In contrast, Principal A admitted, *"Our trainees rely solely on attachments for industry exposure since we have no expert involvement internally."*

Concerns were raised about the limited nature of industrial assessments. As Principal D explained, *"All students are assessed only once during attachment, which is not enough to track their progress."* Principal B added, *"We lack funds to send assessors more than once, so feedback to students is very minimal."*

Finally, all four principals voiced frustration with systemic challenges. Principal C summed it up: *"We do not have enough staff, funding, or logistical support to cope with the rising numbers. This undermines our ability to maintain training quality."*

Conclusion

The study reveals that collaborations between TVET institutions and industries in Kenya are present but largely perceived as ineffective. Industrial attachment emerged as the most dominant form of collaboration, confirming its critical role in bridging theory and practice. However, both trainers and trainees highlighted persistent challenges such as limited institutional capacity, industries turning down attachment requests due to high demand, and significant resource and technological constraints. These

challenges weaken the impact of partnerships, particularly in enhancing employability and aligning training with market needs.

Government policy plays a pivotal role in shaping collaboration outcomes, yet inadequate funding, poor infrastructure, uncontrolled enrolments, and lack of structured incentives hinder progress. Although some joint efforts exist, such as attachment agreements and equipment donations, their uneven application across institutions reduces their effectiveness. Evaluation strategies like logbook marking are widely used, but they need to be complemented with broader and more consistent assessment mechanisms. Overall, while TVET–industry linkages exist, they remain fragmented, under-resourced, and unable to match the demands of rising enrolments and evolving labor market requirements.

Recommendations

For TVET institutions, strengthening collaboration frameworks with industries is essential. Institutions should establish clear and binding agreements that standardize attachments, research projects, and mentorship programs across all trades. This would help create consistency and fairness in access to opportunities while also ensuring that collaboration is mutually beneficial. At the same time, institutions need to prioritize resource mobilization by directing budgetary allocations toward modern equipment, staff training, and ICT integration, which would help reduce the technology gap with industries. Diversifying partnerships is equally important; beyond the traditional industrial attachments, institutions should seek co-designed curricula, industry-led workshops, and innovation hubs that can foster creativity and applied research. Improving assessment systems also remains a priority, with a shift from sole reliance on logbook evaluations toward structured competency-based assessments enriched by industry feedback, which would make training outcomes more relevant to workplace demands.

Industries, on their part, should take an active role in strengthening collaborations with TVET institutions. Expanding training opportunities is critical, particularly through rotational placement models and flexible scheduling that can accommodate the growing number of trainees. Industries should also consider investing in shared training facilities by partnering with institutions to establish joint laboratories or workshops that mirror real industrial environments. Such initiatives not only ease institutional resource pressures but also expose trainees to authentic work practices. In addition, industries should actively support mentorship and knowledge transfer by engaging experts in regular career talks, seminars, and guest lectures, thereby equipping trainees with practical insights into workplace realities.

For government and policymakers, interventions are necessary to create a conducive environment for effective collaboration. A key step would be to control enrolments relative to institutional and industry capacity, so that student admissions are aligned with the available resources and attachment opportunities. The government should also enhance funding to support modern infrastructure and subsidize partnerships, while providing tax incentives for firms that actively host trainees. Developing structured national guidelines is another priority, as these would standardize collaboration models, assessment standards, and clarify the roles of both institutions and industries. Finally, institutionalizing dual training models where learning alternates between classroom instruction and industrial practice would ease pressure on

institutional facilities while strengthening skill transfer, thus producing better-prepared graduates.

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